



Analyzing the Role of Visual Cues in Developing Prediction-Making Skills of Third- and Ninth-Grade English Language Learners

The goal of this action research is to increase student awareness of context clues, with an emphasis on student use of visual cues in making predictions. Visual cues in the classroom were used to differentiate according to the needs of student demographics (Herrera, Perez, & Escamilla, 2010). The purpose of this intervention was to improve students' prediction-making skills as well as to ensure active reading and thinking skills. The research team focused on the research question: What is the relationship between the use of visual cues and predicting skills as a reading-comprehension strategy for 3rd- and 9th- grade English language learners (ELLs)? Our team conducted research in 2 schools, focusing on 1 group of elementary school students and 1 group of high school students. Data collection occurred for approximately 6 weeks in each school. Triangulation of data sources was used to attain a more cohesive understanding of how visual cues relate to students' ability to make predictions during reading.

Introduction

This action research team consists of two English as a second language (ESOL) teachers who serve students of varying age groups, proficiency levels, and learning needs. Teacher A is a third-grade ESOL teacher at a Title I elementary school in Fairfax County, Virginia. Teacher B is a high-intensity language training (HILT) teacher who serves students who are dually identified as English language learners (ELLs) with special learning needs at a high school in Arlington County. As experienced ESOL teachers, we are

aware that reading comprehension is a common denominator to mastering academic language and content at any developmental stage.

As we reflected on our varying teaching situations, we realized that students were not fully understanding what they were reading in class. The focus for our research project was reading skills. We were specifically interested in prediction making as a prereading strategy that would draw upon students' prior knowledge and prepare them for the text. Members of our target population, marginalized because of their language proficiency levels, would benefit from opportunities to make connections with their own experiences. After reviewing many research-based strategies for reading comprehension, we decided that various methods of using visual cues would enhance predicting skills, thereby strengthening reading comprehension of language learners of all ages and developmental levels.

Articulating Theories

Visual Cues as Comprehension Aids

This study regards prediction making as a reading-comprehension strategy and seeks to focus on the relationship between prediction making and visual cues in ELLs from grades 3 and 9. As children receive most of their information via visual cues from birth to approximately age 5, it is vital to take into account the ways in which student needs can be met. Providing an abundance of visual information was an approach we sought to implement. Many beginning readers rely on visuals for clues rather than the words themselves (Cooper, 2002). In human development, visual literacy is acquired before verbal literacy. That is why it is the basic literacy in the thought processes that constitutes the foundation for reading and writing (Stokes, 2001). For many students, both ELLs and non-ELLs alike, parsing graphics may prove far simpler than parsing words (Herrera, Perez, & Escamilla, 2010). As Kreidler (1971) notes, "Unfamiliar cultural aspects can be presented easily through visual aids. Especially overseas, the decoration of the classroom with cultural pictures should not be overlooked" (p. 22). Kreidler, during a study of visual cues and their effectiveness when used among ELLs, also specified that in an ideal learning environment, students should do 80% of the talking.

Visual elements are only one way to assist in stimulating oral language production. Content that was incomprehensible to a student previously will become more understandable once visualization is incorporated (Stokes, 2001). Cooper's 2002 analysis of the levels of image perception, as well as the roles that perception itself plays on student ability to process information, corroborates this and adds that visual elements' relatability depends on a child's funds of knowledge,

cultural background, and extant schemata, which are only some of the elements educators must take into account.

Inclusive Instructional Strategies

One method of fostering student learning via visual cues is incorporating opportunities for students to create their own visual references in class. Drawing, as Armon and Morris (2008) note, is an activity that requires children to observe an object with particular care and can therefore lead students, regardless of their ELL status, to notice details that they might otherwise overlook. In keeping with the levels of image perception outlined by Cooper—acknowledging an image, matching an image to an object, and ability to give an image a name—this also serves as an effective means for ELLs to express thoughts that they may not yet feel comfortable expressing via speaking or writing in English (Armon & Morris, 2008; Cooper, 2002). Guthrie et al. (2004), in their study of the effect of combined motivation support and strategy instruction on reading outcomes among third graders, also supported the inclusion of visual cues, citing reading comprehension's correlation to a wide range of learning styles and strategies. In addition to the importance of organizing information graphically, other strategies included teacher ability to activate students' prior knowledge in order to facilitate text-to-self and text-to-life connections, students' generation of text-related questions, students' ability to create summaries of text, students' ability to find information in text, and student ability to self-monitor.

Visual cues provide an additional dimension of support when teaching academic language to ELLs, whatever the content area. Academic language in and of itself is more difficult than everyday communicative language for ELLs to master, as it tends to be used primarily in specialized settings and is therefore less likely to be acquired through conversation (Herrera et al., 2010; Townsend, 2009). During a language workshop conducted as an after-school program for 37 middle-school-aged ELLs, the curriculum centered on the top 60 most common academic words according to the 2000 version of Coxhead's Academic Word List, and on various visually oriented means of exposing students to specialized vocabulary (Townsend, 2009). Other studies have shown that, while paper-based dictionaries do not always facilitate ELLs' target-language vocabulary, multimedia and electronic sources that provide additional multimodality by combining images, sounds, and text have been shown to effectively facilitate student vocabulary learning (Sato & Suzuki, 2010).

During the aforementioned language workshop, students met for 20 75-minute sessions. During these, they were exposed to academic

content-area vocabulary via activities such as variations on Pictionary, Jeopardy, and Taboo. Students also participated in “gallery walking” through displays of illustrated vocabulary words that the students themselves had created by working in teams, solving “picture puzzlers” by identifying and discussing illustrations associated with vocabulary words (such as an image of a screwdriver to help illustrate the word “function”) and dice games that entailed taping a target word to one side of a die and then actions such as “act it out” or “draw a picture” to the other sides (Townsend, 2009). As Guthrie et al. noted, both motivation and engagement contribute to reading comprehension (2004), and it was largely due to an abundance of visual support and ample opportunities to process new vocabulary in context that the language workshop, the first program of its kind to focus on teaching academic vocabulary to middle schoolers, ultimately succeeded (Townsend, 2009).

Maintaining Student Interest

In keeping with the importance of students’ proficiency at metacognition and critical thinking, as well as the need for constant motivation and encouragement in the classroom, visual cues are one way of both inspiring students’ intrinsic motivation and activating prior knowledge (Cho, Xu, & Rhodes, 2010; Taboada, Bianco, & Bowerman, 2012). Students who, as in the middle school language workshop, are encouraged to generate their own text-based questions may draw confidence and inspiration from realia, room decorations, graphic organizers, or any number of visual elements that can be incorporated into a classroom setting.

Many studies have sought to analyze the effectiveness of various types of visuals, and though the results have been mixed or even contradictory, the use of visual cues in lesson delivery has consistently been regarded as a positive element (Armon & Morris, 2008; Herrera et al., 2010; Kreidler, 1971). One such study, in examining which image modalities were more useful in assisting students’ vocabulary acquisition, found that video clips were more effective than still images and speculated that this was possibly due to multimodality or better ability to catch student interest (Al-Seghayer, 2001). Another study examined whether multimedia language textbooks were more effective than paper-based ones, focusing in particular on teaching prepositions to students learning English as a foreign language (EFL). The results of this study showed that a combination of text and visuals was more effective than either one or the other, likely because of the availability of multiple learning styles and connection-making opportunities (Sato & Suzuki, 2010). With prepositions, using visuals provided

examples of the spatial relations designated by each word, “[making] the image schemata approximate our bodily experiences and therefore facilitate noticing in EFL learners” (Sato & Suzuki, 2010).

Students’ skills at both drawing and writing increase with time as well as with opportunities to build on what they know. Armon & Morris (2008) cite the success of teachers who regularly went over content vocabulary in class, provided multimodal support such as allowing students to respond with either words or images, and as a result noticed the student-generated words and pictures reflecting a steady increase in proficiency. Opportunities to use visual cues are only one means of strengthening student motivation, which in turn increases student engagement in reading activities (Cho et al., 2010). Other visually oriented methods of motivating students include providing high-interest books, collaborative learning, opportunities for students to reflect on making textual connections (e.g., use of flash cards or graphic organizers), and use of interactive websites that promote word association via both visual and auditory channels (Cho et al., 2010; Riley, 2008). Again, it is imperative that educators be aware that visual representations as well as methods of educating vary across cultures, and that in using visuals when teaching ELLs they must take these variations into account (Cooper, 2002). For instance, from which direction do people read in a given student’s home country? Do colors signify different things? Visual aids, above all, should help make verbal communication more clear, not more confusing (Kreidler, 1971).

The more prior knowledge students have in their L1, the more information they will be able to leverage when forming connections on their own; however, this in no way indicates a lack of need for encouragement (Herrera et al., 2010). Making use of visual cues such as word walls, picture walls, or labeled images or objects is an excellent means of helping to improve student familiarity with those objects and, in the process, helping them make connections (Armon & Morris, 2008). As noted by Cooper, children who are exposed to new environments have fewer experiences and a smaller knowledge base to draw from, which often makes the adjustment process more arduous for them than for adults (Cooper, 2002).

Fostering Prediction-Making Abilities

Prediction making is a skill that bolsters both motivation and independent thinking, as it is the students as opposed to the teacher who are selecting the aspects of a text they wish to pursue (Taboada et al., 2012). In a reading-intervention study conducted with a sample group of 15 fourth-grade non-ELL students and 11 Spanish-speaking ELLs, the directed reading-thinking activity (DR-TA) was implement-

ed in small-group settings of no more than six students for a total of 24 sessions. This required all readers to pause at regular points during their reading to process the information they had read and use it to form conclusions about what might happen next. Students did the majority of the talking and were taught to note whether their predictions were supported, in addition to whether they could be revised based on additional information gained from the text. High-interest yet challenging reading materials, as well as teachers' quality, attitude, and expectations, proved to be important (Cho et al., 2010).

In a 1999 study, students from ages 9-13 participated in an activity that entailed rendering their thoughts in storyboard form before putting them into writing, thereby providing self-created visual cues for when they eventually put their thoughts into writing (Cox, 1999). Another study addressed the concept of prediction making and found that having students actually "draw" conclusions was useful in teaching the concept of prediction making and using context clues (McMackin & Witherell, 2005). A variation on this activity is for students to create their own storyboards and then trade with another student who completes the story in writing after using the visual cues to form his or her own conclusions about what might happen next. This can also be differentiated for more emergent learners by allowing them to portray their conclusions in picture form alone, or in both text and pictures. Furthermore, working with a partner provided students with their peers' insights as well as their own (Cox, 1999).

Additionally, relying both on text and visuals for context clues taught students to think critically about what they were reading. The goal for educators is to achieve an ideal balance between verbal and visual cues. Once this balance is achieved, the connection between the two styles of thinking will be nurtured (Stokes, 2001). Reading-comprehension instruction that includes explicit cognitive strategy instruction helps hone student metacognition and, in this case, allowed the reader to take an active role while at the same time placing emphasis on strategic reading that allowed students to integrate new information with their own prior knowledge (Guthrie et al., 2004; Taboada et al., 2012).

To reiterate, although the effectiveness of different types of visuals has been debated, the positive influence of visual cues in and of themselves has been consistently acknowledged. Al-Seghayer's 2001 study of 30 ELLs (who were exposed to text alone, text with pictures, and text with video, and then took vocabulary tests afterward) concluded that video clips were more effective than static images. Sato and Suzuki (2010), however, found no statistical difference in students using 2-D planar visuals as opposed to 3-D and, like Cho et al. (2010),

expressed the importance of providing students with access to text that helps build background knowledge in content areas and includes visuals that students can use to support their predictions.

In conclusion, the most effective visual cues are those that activate students’ schemata, as children are more likely to understand something they can relate to, and that are appropriate to their developmental level. It is vital that educators bear in mind that a student’s ability to process information visually depends on the unambiguous presentation of that information and the student’s own connection-making skills (Cooper, 2002). Although students should provide the bulk of talk time during an ideal lesson, it is the teacher’s prerogative to provide unambiguous visuals as well as unambiguous language, to ensure that meanings are clear and apparent to students from a variety of cultural backgrounds (Kreidler, 1971).

Data Analysis

Triangulation Matrix

<i>Action research question</i>	<i>Data source 1</i>	<i>Data source 2</i>	<i>Data source 3</i>
What is the relationship between visual cues and predicting skills as a reading comprehension strategy for 3rd- and 9th-grade English language learners?	Graphic organizer	Previewing reading	Story cues activity
	Teacher checklist	Multiple-choice test	Teacher rating scale

WIDA Levels

The World-Class Instructional Design and Assessment (WIDA) was used as a measurement for English language-proficiency levels. The English language-proficiency levels used in Virginia range 1 to 6:

WIDA Level 1 (Entering): The student is still in the preproduction stage. Any comprehension of English is limited to a few words.

WIDA Level 2 (Beginning/Production): The student is significantly below grade level. He or she is able to understand and speak both conversational and academic English, albeit with difficulty, and is reading and writing at an emergent or pre-emergent level.

WIDA Level 3 (Developing): The student is able to understand and speak both conversational and academic English with less difficulty than a Level 2 learner. He or she is reading and writing at a post-emergent level and possesses adequate literacy skills to demonstrate content knowledge with assistance.

WIDA Level 4 (Expanding): The student is able to understand and speak conversational English with no apparent difficulty but exhibits some hesitancy with academic language. He or she possesses adequate literacy skills to demonstrate content knowledge and meet grade level expectations with assistance.

WIDA Level 5 (Bridging): The student is able to understand and speak both conversational and academic English with no apparent difficulty. He or she requires support only occasionally and is able to meet grade-level expectations.

WIDA Level 6 (Proficient): The student was formerly classified as limited-English proficient and has since progressed to the point of being able to use and understand English within academic settings with no assistance required.

Data Source 1: Graphic Organizer/Teacher Checklist

Part A: The Results. A graphic organizer titled “Making Predictions in Fiction” (Appendix A) was designed and used by Teacher A to make predictions before and during reading. Students had the opportunity to express their thoughts in words, images, or orally while a teacher recorded their responses. In the “I predict” column, the students recorded a prediction they had drawn based on their assumptions about the text. In the next column, they provided information as to why they had made that prediction. The last two columns allowed the students to record whether or not their prediction was accurate. This process occurred before reading the text as well as at intervals during reading.

A teacher checklist, “Checklist for Prediction Chart” (Appendix B), was designed and used by Teachers A and B to assess the graphic organizer in the following categories: making contextual predictions, giving reasoning for predictions, assessing accuracy, using visual cues, and constructing a correct prediction. Teacher B used the checklist to assess a graphic organizer titled “Making Predictions During Independent Reading.” Teacher B created this graphic organizer and made modifications between administering the pretest (Appendix C) and the posttest (Appendix D). Teacher B reduced the number of predictions from three to two so students could focus on the quality of their responses. The written directions were also changed because students who could write their responses refused to and instead drew them.

Teacher A noticed that her students struggled a great deal in determining whether their predictions were accurate and that they seemed to enjoy using graphic organizers as a means of recording their thoughts. Five out of her six students (83%) were able to use visual references for both prediction making and the reasoning behind it on the pretest, which then increased by 20% on the posttest in both cases. Four out of six students (66%) were able to assess the accuracy of their predictions on the pretest, which increased by 50% on the posttest. On the pretest, 66% of students demonstrated the ability to support their predictions with visual cues, which then increased by 25% on the posttest. Finally, 66% of students' pretest predictions were correct, as compared to 83% on the posttest. The data for this resource can be found in Appendix E1 in the table labeled School A: Making Predictions During Guided Reading and in the bar graph in Figure 1.

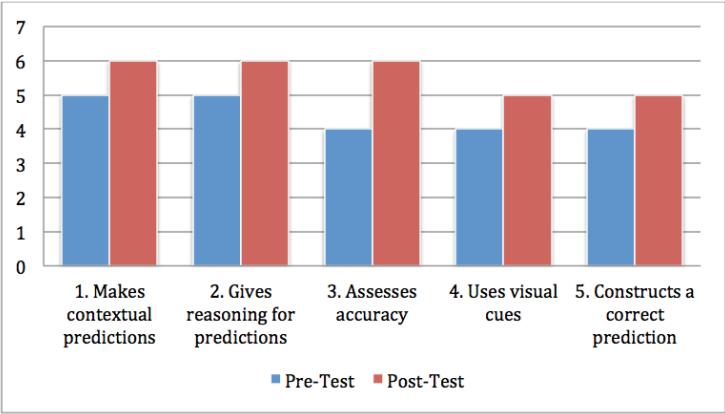


Figure 1. Bar graph showing data from School A: making predictions during guided-reading groups activity.

Teacher B saw varied results after collecting data from the first source. As can be seen in the bar graph in Figure 2 and in the data table labeled School B: Making Predictions During Independent Reading (Appendix E2), there were no changes from the pretest to posttest in terms of making contextual predictions and using visual cues. There was a decrease in giving reasoning for predictions, assessing accuracy, and making a correct prediction. In terms of percentages, giving reasoning for predictions declined by 33%, as did constructing a correct prediction, and assessing accuracy decreased by 17%.

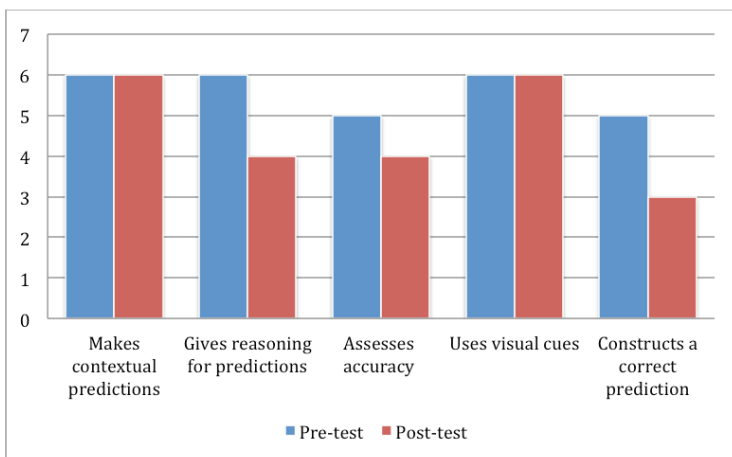


Figure 2. Bar graph showing data from School B: making predictions during independent reading activity.

Part B: Interpretation. Throughout the intervention period, Teacher A extensively reinforced the notion of looking first and responding second. Students were encouraged to view various visual cues and then to discuss the implications of them in pairs or as a group. The small-group setting allowed students to participate without being singled out from amid their entire class. On multiple occasions, students cited examples provided by both Teacher A and their classroom teacher regarding the importance of looking at information before responding to it. This reinforcement of prediction-making strategies most likely contributed to the consistent increase in student-performance quality as demonstrated by the posttest. Students were also already familiar with similar graphic organizers, as they had been keeping them for other content areas.

This kind of graphic organizer was quite effective because not only was it an excellent indicator of prediction-making skills, but it is also used in the Virginia Grade Level Assessment (VGLA) collection. It provided students an opportunity to discuss why their predictions were not accurate and what clues in the book helped them realize this. As stated earlier, at this point students already had a good deal of practice with prediction making, not only from this intervention, but also from their classroom teachers. This might be a possible reason as to why scores were higher in the graphic organizer pretest than in the multiple-choice pretest, which we will discuss in Data Source 2.

Teacher B accredits the decline in the data collected to the various external factors. Neither group consisted of more than four students

at any given time. The recurring absence of two individuals meant that the original projected eight students were reduced to six; however, these final students did participate in the same activities and discussions as their group members on the occasions they were present. Because the numbers of participants decreased from eight students in the pretest to six students in the posttest, this difference resulted in a high level of attrition because 25% of the students selected were not able to participate in both processes and therefore they were not taken into account.

Another important factor is that this assessment was performed during independent reading, which was the least structured of the activities selected. Students were allotted 20 minutes to read independently after having completed this graphic organizer, and they were required to also complete a reading log afterward. The latter is part of the READ 180 (Scholastic, 2011) program and was needed to grade them during this rotation. There are three rotations: independent reading, computer time, and small group, each for 20 minutes. The assessments became tiresome and a few students were not cooperative. Many reluctantly completed the graphic organizer and answers were left incomplete or were drawn inappropriately. As a result, this assessment produced low reliability and high validity because it tied to the reading-program curriculum and research objectives.

Data Source 2: Previewing Reading/Multiple-Choice Test

Part A: The Results. Data Source 2 was a multiple-choice pretest (Appendix F) and posttest (Appendix G) designed by Teacher A to assess students' ability to preview and answer prediction-making questions based on an appropriately leveled text. This was another familiar assessment format and served as a simple means of incorporating visual cues into a standard form of assessment. Teacher A differentiated these assessments according to student reading levels as determined by the Developmental Reading Assessment (Pearson), although the questions for both reading groups remained aligned in terms of number and skills being assessed. Teacher B asked students to preview a reading's title, pictures, and captions from a textbook used with the READ 180 (Scholastic, 2011) program. They were then given five multiple-choice questions related to the reading on the pretest (Appendix H) and the posttest (Appendix I). The questions varied from main idea, to concept definitions, and to the importance of pictures and captions. This data source was scored on a percentage basis.

Teacher A's assessments focused on using visuals as context clues in three different areas: making inferences, making and supporting predictions, and drawing conclusions about new vocabulary. Ques-

tions 1 and 4 both centered on making inferences; in both cases, student performance improved between the pretest and the posttest, with 33% increasing to 66% for question 1 and 83% increasing to 100% for question 4. As can also be noted in the bar graph in Figure 3, questions 2 and 3, which assessed students' abilities to make and support predictions, neither increased nor decreased from pretest to posttest, both remaining at 83% (see Appendix J1, School A: Prediction-Making Questions for Guided Reading). Question 5, however, which also centered on student's prediction-making skills, had a 25% increase between the pre- and posttest. The final question, which called for students to use clues from the text and illustrations to determine the meaning of a vocabulary word, exhibited a 40% decrease. Both pre-tests and posttests for each reading group focused on prediction making using fiction.

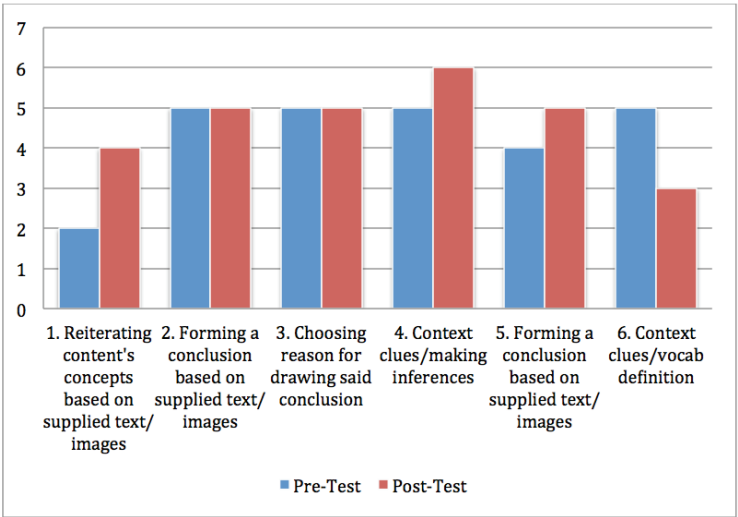


Figure 3. Bar graph showing data from School A: prediction-making questions for guided-reading activity.

Teacher B's data table (Appendix J2) suggests a relationship between using the images, captions, and title to preview a text before predicting its contents. The data show an increase, from the pretest to posttest, of 33% in predicting the main idea, as well as an additional 33% increase in predicting the importance of pictures and captions. Students were taught how to preview a selected reading by walking through examples and speaking out an entire thought process. There was also an 83% increase in predicting the definition of a concept before reading the text, which can be seen in the Figure 4 bar graph. Two

subcategories were eliminated from the results because of a change in the writing of the posttest to prevent the data from being misaligned. This will be discussed in the interpretation of the results collected.

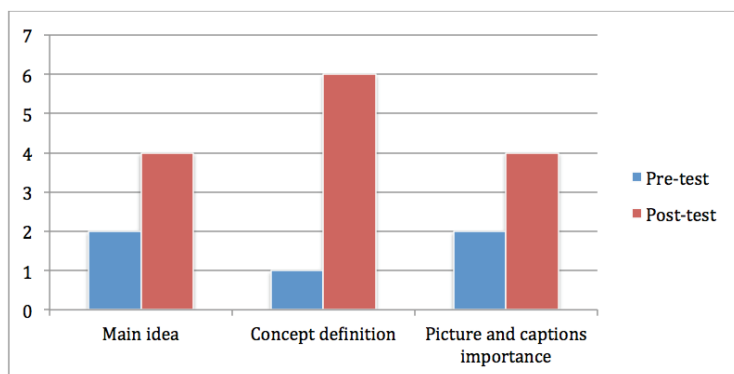


Figure 4. Bar graph showing data from School B: prediction-making questions for rBook reading activity.

Part B: Interpretation. Teacher A initially struggled to design an assessment that both addressed the students' reading material as well as provided ample opportunity for analysis of student prediction-making strategies and skills. However, by expanding the definition of "predict" to include inferences regarding vocabulary as well as characterization and plot development, the assessment became a tool that also measured students' application of prediction making to other areas habitually focused on in their guided-reading groups.

Both the pretest and posttest consist of six questions, out of which three exhibited a general increase while two demonstrated no change and the remaining final question resulted in a percent decrease of 40%. The final question, which dealt with student interpretations of an unfamiliar vocabulary word, was unanimously voted the most challenging when students were asked to provide feedback on both the pretest and posttest. Teacher A believes this is due to the comparative lack of preparation students had in the area of inferring a word's meaning based on the context in which that word appears. The bulk of each guided-reading session throughout the intervention period was dedicated to various methods of using context clues to form predictions relating to a story's plot, not to gauge the definition of a new word. For this reason, the final question detracts from the validity of this data source at large, and in the future Teacher A will take care to ensure that students have received adequate preparation for topics before including them on assessments.

Teacher B notes the decrease in the reliability of this assessment tool because of the reduction and changes made to two subcategories. Initially, the pretest addressed the following additional categories: the type of text (fiction or nonfiction) in Question 4 and where the text came from in Question 5. The latter was an appropriate question for the pretest reading of an article titled “Prepared for Smallpox,” but not for the posttest reading of a nonfiction text, “The Black Death,” with no specific source. Question 5 in the pretest was related to a different story than the posttest. Another modification was question 4 from the type of text, with the following answer options: fiction, nonfiction, or I don’t know, to a concept-definition question. Moreover, Teacher B realized that three answer options did not follow the common four options and could also not substantiate the topic as a valid posttest question. Because question 3 had three possible answers, with an “I don’t know” option, it lacked reliability because of a higher probability of inconsistencies from the results. These two categories were therefore eliminated from the results presented in this data analysis. This assessment did produce high curriculum validity because it supported the reading-program standards and benchmarks.

Data Source 3: Story Cues/ Teacher Rating Scale

Part A: The Results. Data Source 3 (Appendix K), a teacher rating scale, designed by teachers A and B and used to assess a story-cues activity, was administered in groups of two to three students. This allowed for a cooperative-learning opportunity and embraced multiple learning styles, as students responded using combinations of written, drawn, and oral answers. By using this method, we qualitatively and quantitatively assessed students’ work (Craig, 2009). The activity began with an image and a brief description of the scenario as noted in Teacher A’s pretest (Appendix L) and posttest (Appendix M). Students were asked to discuss this image and description before taking turns to complete the sequence in the story based on the information provided. There were three empty spaces for a picture and a description, one from each student, which was used in cooperative groups for Teacher B’s pretest (Appendix N) and posttest (Appendix O). Depending on differentiation needs, students responded to these either orally or in written form.

Teacher A’s posttest results (Appendix P1) suggest a positive association between student proficiency and the story-cues exercise. In the cases of all criteria, a positive change occurred in the percentage of students attaining scores of *agree* and *strongly agree*. Questions 2, 3, and 5 all demonstrated scores of 0% in the areas of both *disagree* and *strongly disagree* upon completion of the posttest. By contrast, on the

pretest, each question resulted in a 16% in the area of *strongly disagree* and between 33%-66% in the area of *disagree* as can be noted in the bar graph in Figure 5. The student averages for each individual criterion increased between administration of the pretest and the posttest.

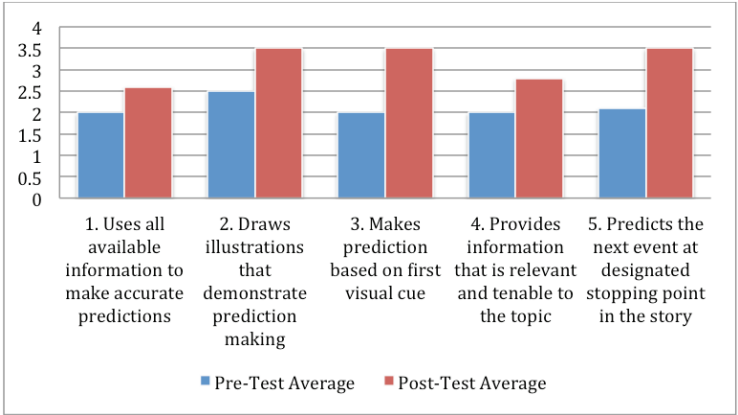


Figure 5. Bar graph with data from School A: story cues in pairs activity.

Teacher B’s data (Appendix P2) shows that there is a strong relationship between the story-cues activity and building predicting skills. All five subcategories increased from the pretest to the posttest: makes accurate predictions, draws illustrations, bases predictions on visual cues, provides relevant and tenable information, and predicts next event at designated point. In terms of percentage growth, the categories labeled “Makes accurate predictions,” “Bases predictions on visual cues,” and “Predicts next event at designated point” grew by 5%, “Draws illustrations” by 9%, and “Provides relevant and tenable information” by 12%. Overall, the scores for the story-cues activity and assessment increased from the pretest to the posttest in School B, which can be noted in the bar graph in Figure 6 (see next page).

Part B: Interpretation. In the case of Teacher A’s students, the opportunity to work cooperatively and creatively appeared to appeal to both guided-reading groups. Informal observation revealed students using media such as writing, drawing, and discussion throughout the creation of their stories. Many students seemed to respond positively to the interpersonal element of this data source, as nearly all of them volunteered to share their completed stories with the rest of the group. One area in particular that students seemed to regard more critically was the ability to make predictions based on previous information they had received, as opposed to creating purely theoretical conjectures out of whole cloth. Repeated emphasis on the importance of first

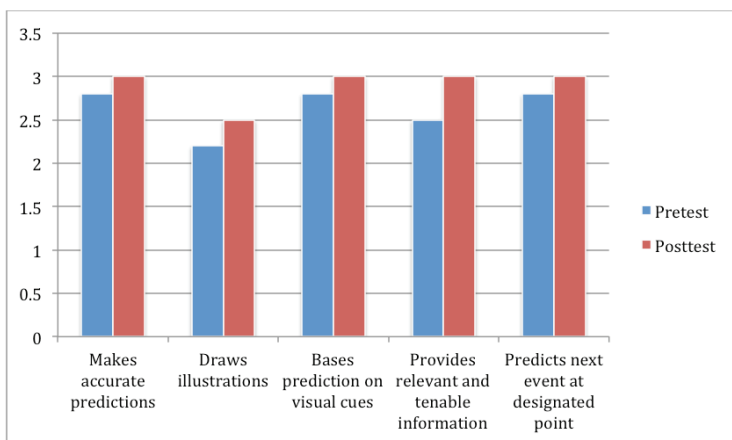


Figure 6. Bar graph showing mean value of data from School B: story cues in cooperative-groups activity.

looking, then thinking, and then predicting seemed to serve students well, as more than half of them were ultimately able to explain the reasoning behind the stories they created.

The data collected from Teacher B's students suggest that cooperative learning facilitated and strengthened the learning environment for making predictions during the story-cues activity. Students were allowed to discuss and share their ideas about the clues they saw and their rationale for making their predictions. They were engaged in the activity and shared their opinions collaboratively. They were eager to discuss their completed stories with the rest of the class and some were even enthusiastic about drawing the illustrations to go with the written description. Students were able to creatively produce language about prediction making in various modalities, which accommodated for different learning styles and needs.

Validity and Reliability

Construct validity for this project could have been higher, as there was only one rater per location and neither team member was familiar with the school or students aside from their own. It might have been beneficial to arrange a few predetermined occasions to go over one another's data and discuss any areas of concern. For the same reasons, inter-rater reliability is also somewhat low. There was only one rater per group of students and little opportunity for team members to provide input on one another's activities because of the differences in grade levels. Internal validity is compromised in that personal bias is a potential factor for both teachers' interventions; however, external

validity is higher in that two diverse student populations were studied and materials were differentiated to best suit each group's needs. The resulting data are, in theory, generalizable to students of varying ages and proficiency levels, although more solid internal validity and a longer period of intervention are both essential.

Both content and consequential validity were somewhat higher than construct validity, as students were able to successfully use reading-comprehension strategies for their intended purposes. This was particularly true in the case of the graphic organizers used as part of Data Source 1 and the look-think-predict thought processes they encouraged as related to prediction-making skills. Students especially thrived when presented exercises that allowed them to express themselves through a variety of modalities (e.g., the story-cues activity).

Data Source 2, the multiple-choice test, was an objective assessment that varied for each group. Both team members differentiated their assessments to ensure that they were aligned with the reading levels and curriculum appropriate to their students' needs. Content validity was notably lacking in the pretest for Data Source 2, as both team members noted components that were not appropriate measures of the objectives the data source purported to represent (e.g., including vocabulary knowledge in an assessment geared toward prediction-making skills). High curriculum validity was present, as each assessment was specifically designed to dovetail with curriculum objectives and state standards.

The final data source provided a more subjective approach in the form of the story-cues activity, a performance-based authentic assessment that allowed students the freedom of creating their own narratives. Each team member then scored these, with the consensus being positive overall; however, it could have been interesting to include a student self-survey as an additional component of this activity. Allowing students the chance to rate their comfort level or frustration level with various prediction-making strategies, and then comparing the resultant data with each rater's own results, could have provided additional insight as to students' own perceived areas of need.

Overall Interpretation: Patterns Across Data Sources

In keeping with our triangulation matrix, Teacher A and Teacher B administered three widely varying data sources in the hope of attaining a more cohesive understanding of how visual cues related to students' ability to make predictions during reading. By incorporating student-generated materials such as graphic organizers, multiple-choice test responses, and partnered narrative activities, we garnered a variety of responses as related to our research question.

After we analyzed the data across all three data sources, it became evident to us that children of all ages require intense instruction and repetition of academic concepts to achieve mastery. Prediction making was not only challenging for students with special needs, but also for children reading at the intermediate levels. Not having that background knowledge shows how it can affect student scores and understanding. In the case of Data Source 1, Teacher B's students' scores dropped between administration of the pretest and the posttest. It has been noted that in both of these cases time and consistent attendance were contributing factors to student familiarity and concentration. Teacher A's students' scores increased in each data source category, a factor that was no doubt assisted by regular check-ins with classroom teachers to ensure that not only were students familiar with the uses of graphic organizers similar to the one being administered as an assessment tool but also that they had regular opportunities to use such tools in their regular classrooms.

Data Source 2, the multiple-choice test, proved problematic for both members in some ways. Both teachers unwittingly included material that threatened the validity of the data source as a whole, which in some cases resulted in the irrelevant questions' being eschewed entirely during the scoring process, thereby providing a smaller data pool. However, student groups at both schools showed consistent promise, with scores increasing between 20% and 50% in the areas of prediction making and providing reasoning for making a given prediction. Data Source 3 yielded the most positive results, with students in both schools scoring between 20-70% higher on the posttest than the pretest in all subcategories.

In all cases, it is also apparent that communication with classroom teachers and rigorous time management are vital if students' needs and comfort levels are to be accommodated. The independent nature of Data Source 1, as well as the single modality in which it was conducted, in writing, set it apart from the other two assessments, which allowed students to use resources such as illustration and conversation in completing them. Even without the added hurdles of adequate time and practice, it is entirely possible students were hindered by the more "traditional" style of the assessment.

Conclusion

The following section contains a personal reflection from each team member based on her experiences and interpretations of data. Furthermore, these reflections discuss the potential application of the study's results in future instructional practices.

Teacher A

Students must receive constant reiteration if they are to use reading-comprehension strategies with any degree of facility and regularity. The graphic organizers became tools that were incorporated into several lessons, so students were accustomed to working with them as well as with the accompanying teacher expectations by the time they began work on the final story-cues activity. While students were initially able to use graphics as resources for prediction making, their work before instruction often demonstrated their uncertainty when asked to use a single graphic to make a given number of predictions (Appendices Q-R). I was fortunate enough to meet with both my reading groups for multiple 20-30-minute sessions weekly throughout the intervention process. The small-group setting itself was, I believe, an important element that permitted more individual attention to student needs and less pressure on students to participate than many of them would have felt had we met as a full class. I have discussed the assessment tools and students' responses with Teacher B as well as with an ESOL teacher who worked with several of the same students the previous year, and we have agreed to continue using similar graphic organizers both in classroom and small-group settings because this proved a key element in helping students gain familiarity with these strategies (Appendices S-T).

Correspondingly, I believe that receiving reinforcement from multiple teachers who have aligned their objectives in advance is one of the greatest assets these students had throughout the intervention process. I regularly touched base with my students' classroom teachers to determine how my own assessment tools could best complement the techniques students were already being taught in the classroom, and I am grateful to have had access to teachers who were both supportive and flexible about accommodating my objectives in tandem with their own. In the future, we hope to regularly create opportunities for students to create graphic organizers to use as personal resources when learning new skills. We discussed the tendency of many English language learners to respond positively to multimodal activities that allow them chances to express themselves via writing, speaking, illustrating, and so on, as opposed to requiring one specific method. We were also intrigued by the story-cues activity and possible ways to modify it to align with goals in various content areas throughout the school year.

Teacher B

Dually identified students are complex because of their language acquisition and special learning needs. Making predictions can

be especially difficult for students with learning disabilities because they are typically not challenged to think critically. The participants in School B are in self-contained classes that follow a modified curriculum, oftentimes diluted and lacking sustenance. Sequencing and guessing the next action can be arduous not only because of their disability, but also because they lack the confidence and assurance in their thought processes and answers. As noted in the student sample (Appendix U), students need time and a comfortable space to produce ideas independently.

When students do not predict, they lose interest in a story and stop reading. Predictions are a form of inference and higher-level thinking; therefore students need practice in making and supporting their predictions. My action plan is to encourage prediction making as a regular process while previewing a text with my students, and even linking it to foreshadowing, which is a commonly used literary device. I also plan to reassure students of the importance of their predictions and how we learn from making either incorrect or correct ones, and to teach them to discuss their ideas in cooperative groups (Appendix V).

I have learned that taking a constructivist approach to teaching, challenging students to build information about the world through various active and dynamic mental processes, is the best methodology. A mixed-methods approach of collecting qualitative and quantitative data with various accommodations gave us an opportunity to equitably assess our students. I would change my approach to designing my multiple-choice assessment tools. I would have discussed the topic with my students and had a sense of what are appropriate and valid questions by conducting a student self-assessment. I would have also shared a draft of my assessment tools with my *READ 180* (Scholastic, 2011) colleagues for input and critique. I plan on sharing my action research findings with my colleagues and students. I hope this project sheds light on the importance of predicting and how valuable a skill it is for students of all ages and grade levels.

Authors

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Appendix A

Data Source 1: Making Predictions in Fiction

Name: _____ Date: _____

Making Predictions in Fiction

Title of Book: _____ Author: _____

Genre: (Please check) Fiction _____ Poetry: _____

Directions: Complete in writing, by drawing a picture, or explaining verbally.

Page #	I predict ...	Why?	Is it correct? Yes/No	If you answered “no,” what happened in the story?

Appendix B
Data Source 1: Checklist for Prediction Chart

Checklist for Prediction Chart

Date: _____

Teacher: _____

Student's name: _____

Grade/ELP level: _____

The student ...

- _____ 1. Made contextual predictions using oral language, in writing, or by drawing a picture.
- _____ 2. Gave reasoning for said predictions, using any modality.
- _____ 3. Assessed the accuracy of the predictions by either writing or stating yes or no.
- _____ 4. Used visual cues to support prediction-making process.
- _____ 5. Made a correct prediction.

Appendix C
Data Source 1:
Making Predictions During Independent Reading Pretest

Name: _____ Date: _____

Making Predictions During Independent Reading

Directions: Make 3 predictions about the book you are reading.
Complete in writing, by drawing a picture, or explaining verbally.

I predict ...	Why?	Did it come true?	If not, what happened in the story?
1.			
2.			
3.			

Appendix D
Data Source 1:
Making Predictions During Independent Reading Posttest

Name: _____ Date: _____

Making Predictions During Independent Reading

Directions: Make 2 predictions about your independent reading book.

I predict ...	Why?	Did it come true?	If not, what happened in the story?
1.			
2.			

Appendix E1
Table 1
School A: Making Predictions During Guided Reading

<i>Subcategories</i>	<i>Pretest</i>	<i>Posttest</i>	<i>Change</i>	<i>Percent change</i>
Makes contextual predictions	5	6	1	+20%
Gives reasoning for predictions	5	6	1	+20%
Assesses accuracy	4	6	2	+50%
Uses visual cues	4	5	1	+25%
Constructs a correct prediction	4	5	1	+25%

Appendix E2
Table 2
School B: Making Predictions During Independent Reading

<i>Subcategories</i>	<i>Pretest</i>	<i>Posttest</i>	<i>Change</i>	<i>Percent change</i>
Makes contextual predictions	6	6	0	0%
Gives reasoning for predictions	6	4	-2	-33%
Assesses accuracy	5	4	-1	-20%
Uses visual cues	6	6	0	0%
Constructs a correct prediction	5	3	-3	-60%

Appendix F
Data Source 2: Multiple-Choice Pretest/Teacher A

The following questions were answered over the course of a guided reading lesson. While prereading a story as a group, students stopped at predetermined points to use the text and illustrations in order to answer each of the assessment questions in turn.

Name: _____ Date: _____

1. What do you think the farmer will do?
 - a. She will take Gilbert for a walk.
 - b. She will find Gilbert some new food.
 - c. She will turn on the radio for Gilbert.
 - d. She will help Gilbert get better.
2. Where do you think they will take Gilbert?
 - a. They will take him to the vet.
 - b. They will take him to the store.
 - c. They will take him to a restaurant.
 - d. They will take him to a dentist.
3. Why do you think they will take him there?
 - a. He was not waking up.
 - b. He was not eating.
 - c. He was not making noise.
 - d. He was not running.
4. What do you think the neighborhood kids will do?
 - a. They will go back home.
 - b. They will think of ideas to clean the farm.
 - c. They will try to forget about Gilbert.
 - d. They will plan a surprise for Gilbert.
5. Why does Amber read to Gilbert?
 - a. She thinks the story will make him hungry.
 - b. Her friends are too busy to read to him.
 - c. Her mom reads to her when she is sick.
6. What do you think the word “appetite” means?
 - a. To enjoy something
 - b. To be hungry
 - c. To dislike
 - d. To be excited

Appendix G

Data Source 2: Multiple-Choice Posttest/Teacher A

The following questions were answered over the course of a guided reading lesson. While prereading a story as a group, students stopped at predetermined points to use the text and illustrations in order to answer each of the assessment questions in turn.

Name: _____ Date: _____

1. Where do you think the raccoons will go?
 - a. They will hide under the porch.
 - b. They will climb the tree.
 - c. They will run inside the house.

2. How do you think the girl will feel?
 - a. Afraid
 - b. Excited
 - c. Sad
 - d. Tired

3. Why do you think she will feel that way?
 - a. She thinks animals are scary.
 - b. She has new friends to play with.
 - c. She does not know where her friends are.
 - d. She is sleepy after a long day at school.

4. What kind of home do the raccoons want to live in?
 - a. A messy home.
 - b. A warm home.
 - c. A home that is not noisy.

5. How will the girl help the raccoons?
 - a. By feeding them dinner.
 - b. By showing them the garden.
 - c. By hiding them in her room.
 - d. By giving them a ride home.

6. When the mother says she is “anxious” what does she mean?
 - a. She is nervous.
 - b. She is sick.
 - c. She is busy.

Appendix H
Data Source 2: Multiple-Choice Pretest Using rBook Reading/
Teacher B

Name: _____ Date: _____

Prediction-Making Questions of rBook Reading

Directions: Open your rBook to page 36. Circle your prediction to each question before you start reading.

1. What do you predict this news article will be about?
 - a. There are a lot of smallpox cases in the U.S. and there is no cure.
 - b. The U.S. has a supply of the smallpox vaccine in case it is a problem.
 - c. No one cares about smallpox because it was a plague that happened a long time ago.
 - d. Smallpox is a serious problem today and the U.S. needs to find a cure.

2. What does **vaccine** mean?
 - a. a disease
 - b. a virus
 - c. a cure
 - d. a solution

3. Why is the picture important? It is important because it is a ...
 - a. photograph of the vaccine.
 - b. snapshot of September 11th and a terrorist attack.
 - c. picture of the smallpox plague.
 - d. print of the research before the vaccine was developed.

4. What kind of text is this?
 - a. nonfiction (fact)
 - b. fiction (not true)
 - c. I don't know

5. Where does this reading come from? It comes from ...
 - a. a short story
 - b. a play
 - c. a news article
 - d. an encyclopedia

Appendix I
**Data Source 2: Multiple-Choice Posttest Using rBook Reading/
Teacher B**

Name: _____ Date: _____

Prediction-Making Questions of rBook Reading

Directions: Open your rBook to page 42 to Reading 3 with the title “**The Black Death.**” Read the captions and look at the picture before circling your prediction to each question.

1. What do you predict is the main idea of this reading?
 - a. The Black Death is a problem in the U.S. and there is no cure.
 - b. The U.S. has a supply of the Black Death vaccine in case it is a problem.
 - c. Scientists do not know why the Black Death was a contagious disease in the 20th century.
 - d. The Black Death was an epidemic that started in the 14th century and it killed 25 million people.
2. What is the Black Death?
 - a. a vaccine
 - b. a cure
 - c. a disease
 - d. a punishment
3. When did the Black Death happen?
 - a. 20th century
 - b. 18th century
 - c. 16th century
 - d. 14th century
4. In the following sentence, what does **estimate** mean?

“Historians **estimate** that it killed 25 million people.”

 - a. to spread
 - b. to find
 - c. to guess
 - d. to solve

5. What do the picture and captions tell us? They tell us that ...
 - a. people couldn't do anything to treat victims, so they didn't try.
 - b. doctors treated the victims by attempting to remove the disease.
 - c. there was no cure for the plague, so everyone died.
 - d. a vaccine for the epidemic was found, so not many people died.

Appendix J1

Table 3

School A: Prediction-Making Questions for Guided Reading

<i>Subcategories</i>	<i>Pretest</i>	<i>Posttest</i>	<i>Change</i>	<i>Percent change</i>
Reiterating content's concepts based on supplied text/images	2	4	+2	+100%
Forming a conclusion based on supplied text/images	5	5	0	0%
Choosing reason for drawing said conclusion	5	5	0	0%
Context clues/making inferences	5	6	1	+20%
Forming a conclusion based on supplied text/images	4	5	1	+25%
Context clues/vocab definition	5	3	-2	-40%

Appendix J2
Table 4
School B: Prediction-Making Questions for rBook Reading

<i>Subcategories</i>	<i>Pretest</i>	<i>Posttest</i>	<i>Change</i>	<i>Percent change</i>
Main idea	2	4	+2	+100%
Concept definition	1	6	+5	+500%
Picture and caption importance	2	4	+2	+100%

Appendix K
Data Source 3: Teacher Rating Scale for Story Cues

Student Name:

Circle One: Pretest/Posttest

Rating Scale for Story Cues

This student or group:	SD	D	A	SA
1. Uses all available information to make accurate predictions	1	2	3	4
2. Draws illustrations that demonstrate prediction making	1	2	3	4
3. Makes prediction based on first visual cue	1	2	3	4
4. Provides information that is relevant and tenable to the topic	1	2	3	4
5. Predicts the next event at designated stopping point in the story	1	2	3	4

Key:

SD = *strongly disagree*

D = *disagree*

A = *agree*

SA = *strongly agree*

Appendix L
Data Source 3: Story Cues Pretest/Teacher A

Directions: Work in pairs to make predictions about what might happen to Frog and Toad next. You may use writing or drawing. Remember, use the first square to help you!

<i>[Image description: illustrations from Arnold Lobel's "Frog and Toad" that show the character Frog sitting in a chair and gradually becoming smaller and smaller. The page reads: "Toad walked on the high wire. 'Frog,' cried Toad, 'can you do tricks like this?' 'No,' peeped Frog, who looked very, very small."]</i>	

Appendix M
Data Source 3: Story Cues Posttest/Teacher A

Directions: Work in pairs to make predictions about what might happen to Frog and Toad next. You may use writing or drawing. Remember, use the first square to help you!

<i>[Image description: illustrations from Arnold Lobel's "Frog and Toad" that show the characters trying unsuccessfully to fly a kite. The page reads, "Toad ran back to Frog. 'This kite is a joke,' he said. 'It will never get off the ground.'"]</i>	

Appendix N
Data Source 3: Story Cues Pretest/Teacher B

Names: _____ Date: _____

Story Cues in Cooperative Groups

Directions: Get in groups of 3. Each student will draw and write in one box. Make a prediction and complete in writing, by drawing a picture, or explaining verbally.

<i>[Image description: Stock photograph of high school-aged students bored in class.]</i>	
Mr. Young's biology class was so boring his students were falling asleep. They needed to get up and move around.	

Appendix O **Data Source 3: Story Cues Posttest/Teacher B**

Names: _____ Date: _____

Story Cues in Cooperative Groups

Directions: Get in groups of 3. After discussing your predictions, each student will draw a picture and write a brief description. Each student will complete one box.

1. <i>[Image description: Stock photograph of a man shoplifting and getting caught by the security guard in the store.]</i>	2.
Tom went to the store for a snack. He forgot his wallet at home, so he decided to shoplift. A security guard saw him and stopped him in the act.	
3.	4.

Appendix P1
Table 5: School A: Story Cues in Pairs

<i>Subcategories</i>	<i>Pretest</i>	<i>Posttest</i>	<i>Change</i>	<i>Percent change</i>
Uses all available information to make accurate predictions	2	2.6	+0.6	+30%
Draws illustrations that demonstrate prediction making	2.5	3.5	+1.0	+40%
Makes prediction based on first visual cue	2	3.5	+1.5	+75%
Provides information that is relevant and tenable to the topic	2	2.8	+0.8	+40%
Predicts the next event at designated stopping point in the story	2.1	3.5	+1.4	+67%

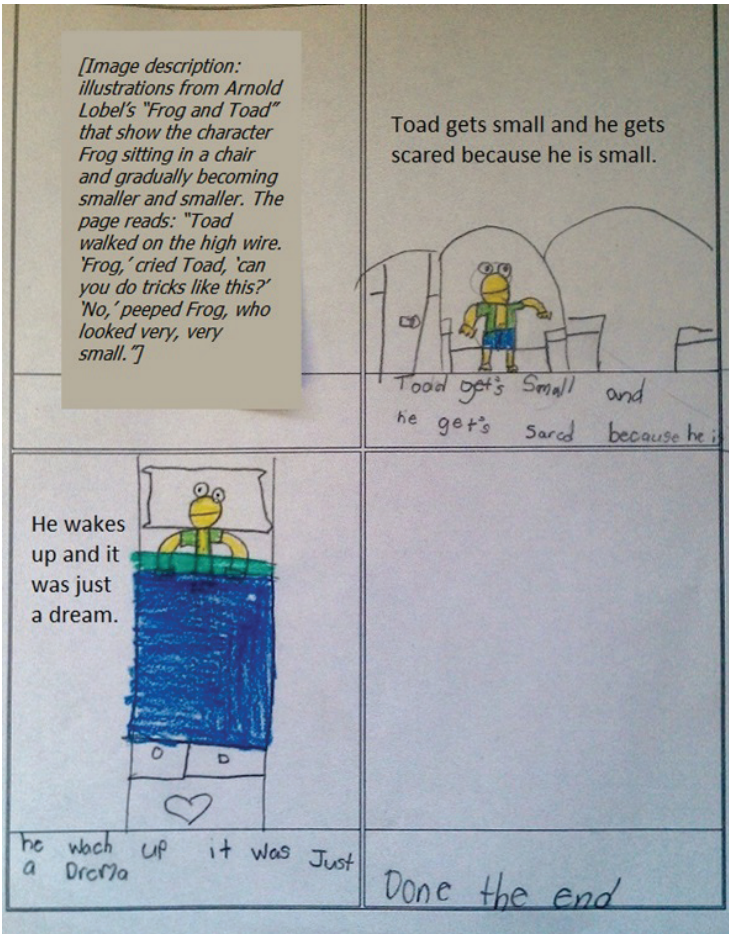
Note. Mean value of pretest and posttest scores.

Appendix P2
Table 6: School B: Story Cues in Cooperative Groups

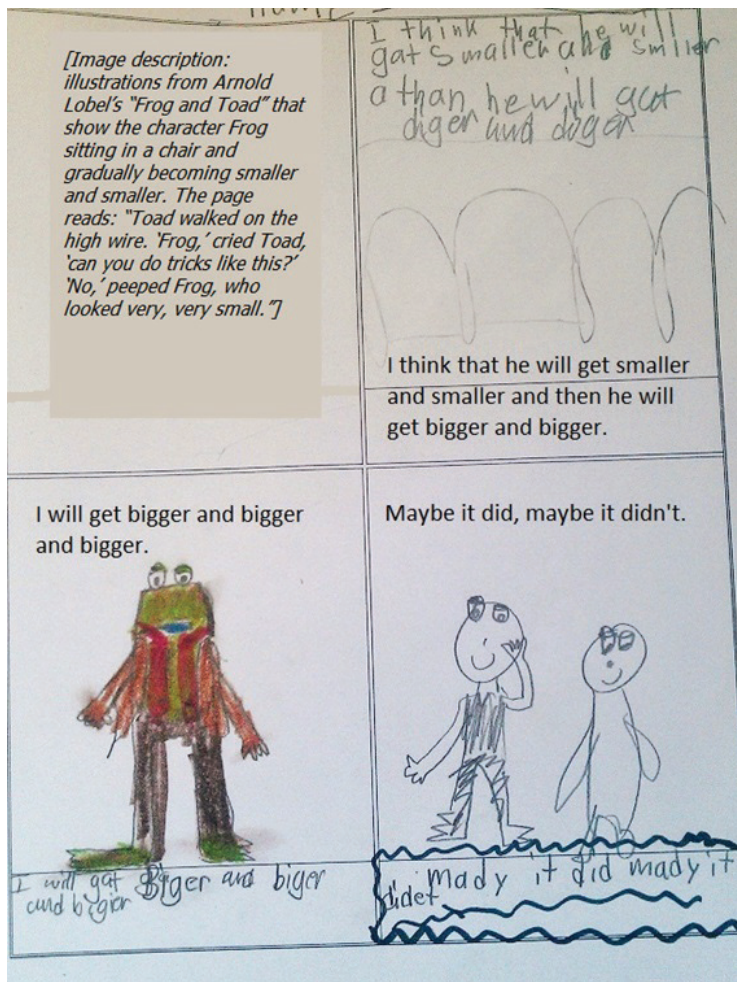
<i>Subcategories</i>	<i>Pretest</i>	<i>Posttest</i>	<i>Change</i>	<i>Percent change</i>
Makes accurate predictions	2.8	3	+0.2	+7%
Draws illustrations	2.2	2.5	+0.3	+14%
Bases prediction on visual cues	2.8	3	+0.2	+7%
Provides relevant and tenable information	2.5	3	+0.5	+20%
Predicts next event at designated point	2.8	3	+0.2	+7%

Note. Mean value of pretest and posttest scores.

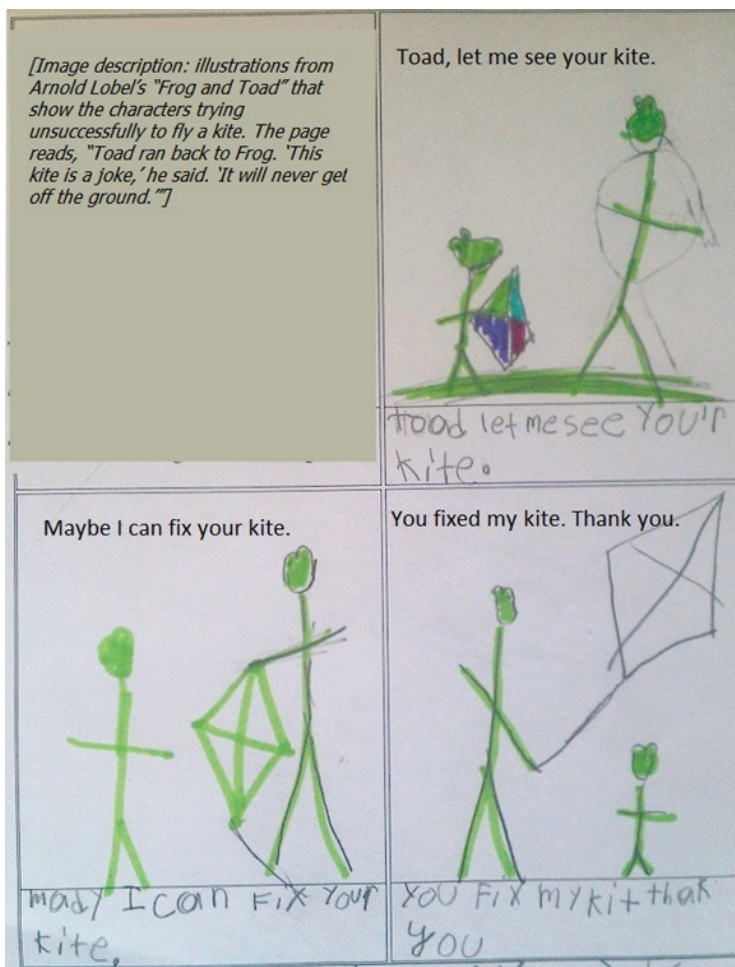
Appendix Q Samples of Student Work (Preassessment)—Teacher A



Appendix R Samples of Student Work (Pre-Assessment)—Teacher A


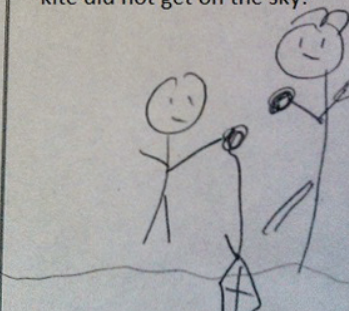


Appendix S **Samples of Student Work (Post-Assessment)—Teacher A**



Appendix T

Samples of Student Work (Post-Assessment)—Teacher A

<p><i>[Image description: illustrations from Arnold Lobel's "Frog and Toad" that show the characters trying unsuccessfully to fly a kite. The page reads, "Toad ran back to Frog. 'This kite is a joke,' he said. 'It will never get off the ground.'"]</i></p>	 <p>Frog said the kite can fly look see</p>
<p>But when Toad did it, the kite did not get on the sky.</p> 	<p>Frog said the kite can fly, look and see.</p>
<p>But when toad did it the kite did not get on the sky</p>	<p>So the second time he did it, the kite went in the sky.</p> <p>So the second time he did it the kite went in the sky</p>

Appendix U

Samples of Student Work—Teacher B

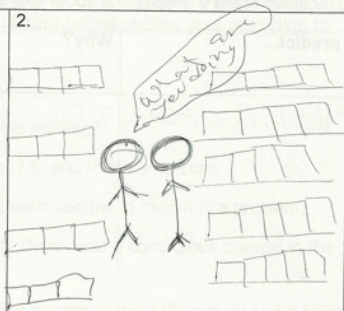
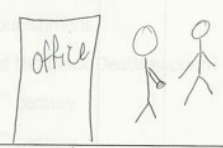
Making Predictions During Independent Reading

Directions: Make 3 predictions about the book you are reading. Complete in writing, by drawing a picture, or explaining verbally.

I predict...	Why?	Did it come true?	If not, what happened in the story?
1. Abram Lincoln might lose on his second election.	because he fail two of his debates. his speaker wasn't that much	No	Lincoln won the election.
2. Garfield would win the the election.	because a lot of people voted for him	Yes	Garfield actually won the election.
3.			

Appendix V

Samples of Student Work—Teacher B

Story Cues in Cooperative Groups	
<p>Directions: Get in groups of 3. After discussing your predictions, each student will draw a picture and write a brief description. <u>Each student will complete one box.</u></p>	
<p>1.</p> <p><i>[Image description: Stock photograph of a man shoplifting and getting caught by the security guard in the store.]</i></p>	<p>2.</p> 
<p>Tom went to the store for a snack. He forgot his wallet at home, so he decided to shoplift. A security guard saw him and stopped him in the act.</p>	<p>The security guard would ask him what is he doing</p>
	<p>4.</p>
<p>Tom will go to the office and tell about what he is doing</p>	<p>The store will call the police or let him go.</p>